University of Bahrain
College of IT
Department of CE

Computer Architecture (ITCE 362)
Academic Year: 2009-2010
Semester: I
Mid Term Exam 2 –Sample Exam

A

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Student Name:	
Student ID:	**Section:**

Question	Points Attached
1 (40 Marks)	
2 (20 Marks)	
3 (16 Marks)	
4 (24 Marks)	
Total (100 Marks)	

Q1) Write the abstract and concrete RTN for the following instructions (40 marks)

1- addi ra, rb, c2

Abstract RTN		
Concrete RTN	Micro-operation	Control Signals
T0		
T1		
T2		

T3		
T4		
T5		
T6		

2- shl ra, rb, c2

Abstract RTN		
Concrete RTN	Micro-operation	Control Signals
T3		
T4		
T5		
T6		
T7		

3- not ra, rc

Abstract RTN		
Concrete RTN	Micro-operation	Control Signals
T3		
T4		
T5		
T6	`	

Q2) Answer the following: (20 marks)

I. What is the meaning of the following RTN description? (16 marks)

a- Op<4..0> := IR<31..27>

b- M[x]<31..0> := Mem[x]#Mem[x+1]#Mem[x+2]#Mem[x+3]:

II. What is the meaning of the following RTN notations: (6 Marks)

RTN	Meaning
;	
@	
#	
:	
→	
< >	

Q3) Answer the following questions:

I. If the content of r2 is: (6 Marks)

1001 0111 1110 1010 1110 1100 0001 0110

What is the content of r1 after executing the (**shc r1, r2, 5)** instruction:

II. Assume that in a certain byte addressing machine all instructions are 32 bits long. Assume the following state of affairs for the machine: **(10 Marks)**

Address	Value
PC	100
r0	200
r1	300
100	200
104	300
108	400
200	500
300	600
500	700

Instruction	Addressing Mode	Value of r0 after Execution
Load r0, #200	Immediate	
Load r0, 200	Direct	
Load r0, (200)	Indirect	
Load r0, r1	Register	
Load r0, 200[PC]	Relative	

Q4) Answer The following:

a- Encode the following instructions: (10 pts)

shra r17, r29, 25

b- Answer with T or F and correct the false: (10 marks)

1- The informal language is better than informal language.

2- CISC is newer than RISC

3- The effective address for the instruction ld r1, 44(r1) can be calculated by r1+44.

4- The abstract RTN description describes the detail execution of an instruction.

5- Relative addressing mode uses PC and register.

Opcode	Value	Opcode	Value
ld	**1**	**And**	**20**
ldr	**2**	**Andi**	**21**
st	**3**	**Or**	**22**
str	**4**	**Ori**	**23**
la	**5**	**Not**	**24**
lar	**6**	**shr**	**26**
br	**8**	**shra**	**27**
brl	**9**	**shl**	**28**
add	**12**	**shc**	**29**
addi	**13**	**nop**	**0**

sub	**14**	**stop**	**31**
neg	**15**